

CENTRE FOR ECONOMIC POLICYRESEARCH

Australian National University

DISCUSSION PAPERS

Old-age Support in Indonesia: Labor Supply, Intergenerational Transfers and Living Arrangements*

Lisa Cameron^a and Deborah Cobb-Clark^b

DISCUSSION PAPER NO. 429

May 2001

ISSN: 1442-8636

ISBN: 0 7315 2293 1

* We would like to thank Tom Crossley for helpful comments. Robert Breunig and Mardi Dungey provided helpful programming advice. Correspondence should be addressed to Lisa Cameron at l.Cameron@ecomfac.unimelb.edu.au

^a Department of Economics, University of Melbourne;

^b Social Policy Evaluation, Analysis and Research Centre and Economics Program, Research School of Social Sciences, Australian National University

CONTENTS

	Page
Abstract	iii
1 Introduction	1
2 Previous Literature	2
3 The Theoretical Model: The Single Child Case	4
Living Separately	4
Living Together	6
The Coresidency Decision	6
4 Empirical Model and Estimation Strategy for the Case of Multiple Children	6
Living Separately	7
Living Together	8
The Coresidency Decision	9
5 The Indonesian Family Life Survey	9
6 Coresidency, Transfers and Labor Supply as Sources of Old-Age Support	12
Coresidency Among Indonesian Elderly	12
Transfers to Indonesian Elderly from Non-Coresiding Children	15
The Labor Supply of Indonesian Elderly	17
7 Conclusions	19
References	20
Appendix	23

ABSTRACT

This is the first paper of which we are aware that attempts to formally model the supply-supply behavior of elderly individuals in a developing country. Without broad-based public pension schemes, the majority of the elderly in developing countries are left to rely on their own current and accumulated earnings and support from children as means of support. Our cooperative bargaining framework allows us to jointly estimate the determinants of coresidence, financial transfers from non-coresiding children, and the supply-supply of elderly Indonesians as alternative forms of old-age support. We find that many Indonesians, especially men, continue to work well into old age and there is little evidence that financial transfers from Indonesian children are a substitute for the income support provided by the elderly parent's own supply supply. Transfers are negatively related to normal weekly hours of work only for non-coresiding mothers.

1 Introduction

The rapidly aging populations of industrialized nations have received a lot of attention recently. That the populations of many developing countries are also aging significantly is much less widely known.¹ The consequences of population aging in developing nations are likely to be just as serious as those experienced by developed countries, but may present very different challenges. For instance, the virtual absence of established pension schemes prevalent in wealthier countries suggests an entirely different set of policy responses. Without pension schemes, the majority of the elderly in developing countries must depend on some combination of coresidency with children, the receipt of financial transfers from children, their own labor market income and their own, often meagre, asset stocks as their main forms of old-age support. The reliance on support from children will be particularly strained as elderly dependency ratios increase.²

Little is known about the link between transfer behavior and coresidency patterns in developing countries and even less has been written about elderly individuals' labor supply. Thus, this paper focuses primarily on elderly labor supply, but develops a theoretical model in which labor supply is determined simultaneously with coresidency and the receipt of transfers. In particular we are interested in examining the quantitative importance of each of these three forms of support and establishing whether transfers and coresidency are targeted in terms of being responsive to the needs of the parents and the ability of the children to give. Finally, we wish to obtain an understanding of the relationship between these financial transactions – that is the extent to which they are complements or substitutes. This will provide some insight into how the changes in one form of support over time are likely to impact on the other forms of support and what the welfare consequences are likely to be.

We begin by building upon a theoretical model originally developed by Pezzin and Schone (1996) to examine old-age support in the United States. The theoretical framework allows for the simultaneous determination of different forms of old-age support for Indonesian elderly. Specifically, coresidency, the receipt of transfers and the parent's labor supply are determined as the outcome of bargaining between children and parents.³ The model suggests a simultaneous system of equations which we then estimate using data from the Indonesian Family Life Survey (IFLS). The IFLS is a particularly rich source of information on Indonesia's elderly population.

¹ Indonesia for instance has the third largest population over the age of 65 in the world (Adlakha and Rudolph, 1994), and the number of Indonesian elderly is projected to increase by 400 percent between 1990 and 2025 (Kinsella and Taeuber, 1993).

² Indonesia's dependency ratio has been predicted to double from 5 persons aged over 65 per 100 persons aged 15-64, to 10 in 2010, Adlakha and Rudolph (1994).

³ In Pezzin and Schone's (1996) model the variables of interest are the living arrangement of the parent, the amount of time the daughter dedicates to providing care for the parent, and the daughter's labor supply. In a related paper they also model cash transfers, but do not implement it empirically because of the lack of importance of cash transfers in the U.S. data (Pezzin and Schone, 1998).

Our results indicate that transfers from non-coresiding Indonesian children to their elderly parents are not strongly related to parental need (as measured by parental and coresiding siblings' characteristics) or the ability to give (as measured by non-coresiding children's characteristics). In general, elderly labor supply is also not sensitive to other income support in the form of coresidency or transfers. The exception is coresiding women who decrease their labor supply as their children's transfers increase.

The outline of the paper is as follows. In Section 1 we review the existing literature on support for the elderly in developing countries. In Section 2 we set up the theoretical bargaining model, while in Section 3 we discuss the IFLS data in more depth. In Section 4, we explain the estimation technique and present the results produced by estimating the system of equations suggested by the theory. Finally, Section 5 presents our conclusions and suggests some directions for future research.

2 Previous Literature

Despite a growing interest in the welfare of the elderly in developing countries, remarkably little has been written on the labor supply of the elderly in these nations, or elsewhere. The only study of elderly labor supply of which we are aware is Cain (1991), which provides a descriptive account of the daily activities of a small sample of elderly individuals in rural Bangladesh, and Hanoch and Honig (1983), which examines the labor supply behavior of the elderly in the United States. Adlakha and Rudolph (1994) provide some descriptive statistics of average hours worked by Indonesian elderly, which show that two-thirds of older men and one-third of older women remain economically active.⁴

There is a small existing literature that examines the factors related to an elderly parent's decision to coreside with one of his/her children. DaVanzo and Chan (1994) examined coresidency in Malaysia, Cameron (2000) and Beard, Frankenburg and Saputra (1999) analysed data from Indonesia, and Martin (1989) conducted a cross-country comparison of coresidency behavior in Fiji, Korea, Malaysia and the Philippines. While DaVanzo and Chan (1994) find that coresidency responds to economic variables such as the parent's income and housing prices, Cameron (2000) and Martin (1989) find only very small effects of economic variables on coresidency. Frankenburg, Beard and Saputra (1999), using panel data, also found that economic factors did not play a significant role in the transition to coresidency in Indonesia.⁵

The literature on intergenerational transfer behavior is much more developed and builds on a significant literature on transfers in developed countries. Research for both developed and developing countries has, to a large extent, focused on differentiating between various theories of transfer behavior and examining whether public pensions

⁴ Niehof (1995), although not dealing directly with labor supply, presents an interesting overview of the experiences of elderly Indonesians.

⁵ See Hoerger, Picone and Sloan (1996) for a paper that examines elderly living arrangements in the United States.

crowd out private transfers.⁶ In addition to old-age income support, the main motives that have been invoked to explain transfer behavior are: altruism amongst family members (Becker 1974, 1991 and 1993); payments for services (such as child care) provided by family members (Bernheim, Shleifer and Summers, 1985); insurance mechanism to promote consumption smoothing across family members; and repayment to parents for their earlier investment in the child, for example educational expenditure.⁷

The attempts to empirically differentiate between these theories have met with limited success. Lillard and Willis (1997) find strong evidence of the parental repayment hypothesis in Malaysian data, but also weak evidence of all of the other motives. Secondi (1997) and Hoddinott (1992) find evidence that transfers are consistent with the exchange motive in China and Kenya respectively. Other studies of Kenya (Knowles and Anker, 1981) and Botswana (Lucas and Stark, 1985), however, have been inconclusive.⁸ Finally, Ravallion and Dearden (1988) find that transfers on the Indonesian island of Java are generally targeted towards the disadvantaged, i.e., the sick, elderly, or unemployed although there are large and important differences between transfers in rural and urban areas.

This study, although shedding some light on this debate, does not aim to differentiate between possible motives for intergenerational transfers. Instead the aim is to contribute to our understanding of the entire package of support that is available to the elderly in developing countries by simultaneously modelling coresidency, transfers and labor supply.⁹ Unlike the previous research on transfers, we are specifically focused on transfers to the elderly. Furthermore, previous researchers have generally ignored the supply-supply and coresidency decisions of the elderly parent or treated these decisions as exogenous to the transfers decision.¹⁰ A more realistic scenario is one in which the package of old-age support is decided simultaneously with transfers for instance being a function of the labor market earnings and living arrangements of the recipient. These two decisions will, in turn, be affected by the level of transfers.

⁶ See Cox and Jimenez (1992) and Jensen (1996) for example. Khemani (1999) takes a different approach and examines whether intergenerational transfers in Indonesia are explained by bargaining between husbands and wives as to how much to transfer to their respective parents.

⁷ Lillard and Willis (1997) provide more extensive descriptions of each of these motives.

⁸ Results from developed countries have been just as indecisive. For example, Cox (1987) and Cox and Rank (1992) reject altruism on the basis that transfers in the United States are positively correlated with recipient's incomes, while McGarry and Schoeni (1995) and Altonji, Hayashi and Kotlikoff (1995) find the opposite correlation and conclude in favour of altruism. There have also been attempts to examine transfers within households, see Kochar (1997) and Pezzin and Schone (1997).

⁹ None of the aforementioned studies specifically focused on transfers to the elderly. In fact, the focus of the U.S. literature has been on transfers from parents to children. In developing countries, the majority of transfers flow in the opposite direction, that is, from children to parents. See Lillard and Willis (1997) for Malaysia, Secondi (1997) for China, and Ravallion and Dearden (1988) for rural Java.

¹⁰ Rosenzweig and Wolpin (1993) jointly model living arrangements, transfers from parents to children and children's human capital investments in the United States. Lillard and Willis (1997) initially allow coresidency to be endogenous in their transfers equations but conclude that it is exogenous.

3 The Theoretical Model: The Single Child Case

This paper attempts to formalize the examination of elderly labor supply in developing countries. Following Pezzin and Schone (1996) we use a cooperative bargaining framework to simultaneously model the labor supply of the elderly as well as the living arrangements of and transfers between adult children and their elderly parents. There are three main theoretical steps. First, we characterize the labor supply and transfer behavior that would prevail if the child and parent lived separately. Second, we examine the outcome of Nash bargaining if a joint household were to be formed using the “living separately” solution to define the child and parent’s respective threat points in this state. Third, coresidency is determined by a comparison of the utility obtained by each individual in the two possible states. Coresidency occurs if both parties receive higher utility when living together than when living alone. We first go through the case where the parent has only a single child. In developing our estimation framework, however, we expand the model to allow for the possibility of multiple children.

Living Separately:

We characterize the utility functions of the child, U^C , and the parent, U^P , as:

$$U^C(X^C, L^C, W(L^P; D); \theta^C) \quad (1)$$

$$U^P(X^P, L^P, W(L^P; D); \theta^P) \quad (2)$$

where X^i with $i = C, P$ is the vector of private goods consumed by the child and the parent respectively, L^i is the amount of leisure each consumes and W is a public good consumed by both the parent and the child. An important element of the model is that the child is assumed to “care” for their parents in the sense that a measure of the parent’s welfare appears in the utility function of the child. W can be conceptualized as the elderly individual’s health status or a broader indicator of the parent’s well-being that the child cares about. Thus, the inclusion of the parent’s well-being in the child’s utility function introduces an element of altruism to the model.¹¹ The parent’s “well-being” is modeled as a function of the elderly individual’s labor supply and any long-term disability experienced by the individual. Finally, θ^i is a vector of the parent’s and child’s taste parameters.

¹¹ Note that a truly altruistic model would include the parent’s utility function as an element of the child’s utility function. This model however collapses to one of income sharing. That is, the distribution of income between parent and child should not affect the outcome of the utility maximisation. The income-pooling hypothesis has however been widely rejected in the literature and on this basis we opt for the model above. This is an intermediate position between full altruism and individualistic pay-off maximization. In our model, the child cares about only particular components of the elderly individual’s welfare.

Both individuals maximize their utility relative to their respective budget constraints, which are given by

$$w^C T + V^C = X^C + w^C L^C + TR \quad (3)$$

$$w^P T + V^P + TR = X^P + w^P L^P \quad (4)$$

where T is the full endowment of time, w^i is the labor market wage (including in self-employment), and TR is transfer payments from the child to the parent. While V^P are any other forms of non-earned income the parent receives, V^C is the child's unearned income. Finally, the price of the private good is normalized to one.

Thus, the elderly individual is assumed to choose his/her labor supply to maximize (2) subject to (4). Note that for simplicity we do not allow for the possibility of saving in the theoretical model and so choosing L^P completely determines X^P . The level of transfers received, TR , is determined by the child who chooses X^C and L^C to maximize his/her utility subject to (3).

The appearance of the elderly parent's well-being, W , in both utility functions generates an interdependency between the decisions of the child and the parent. The parent's labor supply decision is a function of the transfers received from the child while the child's transfer decision (which is completely determined by the choice of X^C and L^C) is in turn a function of the parent's well-being and hence the parent's labor supply decision. We resolve this circularity by assuming a Cournot-Nash equilibrium solution. Thus, the parent and child make their decisions simultaneously, taking the decisions of the other as given.

The parent decides how many hours to work, taking the child's transfer decision as given. Hence:

$$L^P = f(V^P, w^P, \overline{TR}; D, \theta^P) \quad (5)$$

The child similarly decides upon a consumption level and labor supply which determines transfers. Hence:

$$TR = f(V^C, w^C, \overline{L}^P; \theta^C) \quad (6)$$

The outcome is determined by the intersection of these reaction functions. At this point the beliefs of the child and the parent are satisfied so that $\overline{L}^P = L^{P*}$ and $\overline{TR} = TR^*$. The outcome can thus be characterized as:

$$\Psi^C = \Psi^C(V^C, w^C, L^{P*}) \quad (7)$$

$$\Psi^P = \Psi^P(V^P, w^P, TR^*). \quad (8)$$

Living Together:

In the case where the child and parent live together then, we assume that household bargaining proceeds according to a Nash bargaining rule. The equilibrium values of L^P and TR will thus maximize the product of the gains from household formation, defined relative to the utilities at the respective threat points:

$$N = [U^C - \Psi^C] \cdot [U^P - \Psi^P]$$

subject to the joint budget constraint:

$$V^C + V^P + (w^C + w^P)T = (X^C + X^P) + w^C L^C + w^P L^P \quad (9)$$

Note that Ψ^C and Ψ^P , given by equations (7) and (8), reflect the utility that each party would receive if they lived separately.

Hence, when the parent and the child coreside, all household decisions are a function of the characteristics of both the parent and the child. That is:

$$L^P = L^P(\theta^C, \theta^P, w^P, w^C, V^P, V^C, D) \quad (10)$$

$$TR = TR(\theta^C, \theta^P, w^P, w^C, V^P, V^C, D) \quad (11)$$

The Coresidency Decision:

Whether the parent coresides or not is ultimately a function of the utility obtained in each of the two possible states and so is a function of all of the variables in the system: More specifically, coresidency (C) is given by the following:

$$C = C(\theta^P, \theta^C, w^P, w^C, V^P, V^C, D) \quad (12)$$

4 Empirical Model and Estimation Strategy for the Case of Multiple Children:

Equations (5), (6), (10), (11) and (12) provide the basis of an estimating strategy. This framework however ignores the possibility that elderly individuals may have more than one child. Most previous studies have examined parent/child pairs and ignored the existence of other children.¹² Unlike many data sets however, the IFLS provides

¹² Pezzin and Schone (1999) for example.

information on all the living children of the elderly individuals and on how much the non-coresiding children transfer to their parents. Hence, we can examine how parental labor supply responds to total transfers from non-coresiding children, not just those from an individual child. Once one acknowledges the existence of more than one child the possibility arises that children's transfer behavior may be conditioned on the transfer behavior of their siblings. We do not explicitly model such interactions but below we develop estimating equations that acknowledge the possibility of such behavior.¹³

Living Separately:

If a parent does not coreside with any of his/her adult children then, as suggested by equation (5), the parent's labor supply is a function of parental characteristics and the level of transfers received. Here however, transfers received will be the total transfers received from all children. Assuming a linear functional form for the transfer equation yields:

$$LS^P = \beta_{0n} + \beta_{1n}Z^P + \gamma_{1n}\Sigma TR^* + \varepsilon_1 \quad (13)$$

where $Z^P = \{V^P, w^P, \theta^P, D\}$ is a vector of parental characteristics and ΣTR^* is the sum of transfers from all non-coresiding children. The asterisk indicates that the transfer term is endogenous and will need to be instrumented in the estimation.

The transfers equation (6) suggests that transfers are a function of the characteristics of the children (who are in this case, by definition, all non-coresiding) and the parent's labor supply. When there are multiple children, in addition to taking the parent's labor supply decision as given, each child is assumed to take the other sibling's transfer behavior as given. Hence for each child:

$$TR_j = TR(V^C, w^C, \overline{L^P}, \sum_{j \neq k} \overline{TR}; \theta^C) \quad (14)$$

The outcome is then represented by the intersection between the parent's reaction function and the reaction function of all the children. The resultant reduced-form transfers equation is:¹⁴

$$\Sigma TR = \pi_{0n} + \pi_{1n}Z^{NC} + \pi_{2n}Z^P + u_2 \quad (15)$$

where Z^{NC} is a vector containing the values of V^C , w^C and θ^C which pertain to non-coresiding children. Unlike the single child case, the children's characteristics can now

¹³ See Hiedemann, B. and S. Stern (1998) and Engers and Stern (1998) for studies that explicitly models interactions between children. Analyzing transfers in Malaysia, Lillard and Willis (1997) conclude that their results provide little empirical evidence that the behavior of siblings affects individuals' transfers to their parents.

¹⁴ Given that this paper's primary focus is on labor supply and the difficulty in identifying the transfers equation, we only estimate the reduced form of the transfers equation.

affect transfers in two ways: via their direct effect on the amount of money a child wishes to transfer and indirectly through their siblings' propensities to transfer.

Living Together:

If the parent instead lives with one or more children then, as suggested by equation (10), the parent's labor supply will be a function of parental characteristics and the characteristics of the coresiding children. In the multiple child case there is, however, the possibility that in addition to coresiding children, the parent will also have and receive transfers from non-coresiding children. Hence, the sum of transfers received from these non-coresiding children will also enter the labor supply equation:

$$LS^P = \beta_{0n} + \beta_{1r}Z^P + \beta_{2r}Z^{CC} + \gamma_{1r}\Sigma TR^* + \varepsilon_2 \quad (16)$$

where Z^{CC} is defined analogously to Z^{NC} .

The total transfers received from these children will, as in equation (15), be a function of their own characteristics and their siblings' characteristics—both coresiding and non-coresiding siblings. The coresiding children's characteristics also enter the reduced form transfers equation via their effect on labor supply. Hence, the transfers equation becomes¹⁵:

$$\Sigma TR = \pi_{0r} + \pi_{1r}Z^P + \pi_{2r}Z^{NC} + \pi_{3r}Z^{CC} + u_2 \quad (17)$$

Although transfers received from coresiding children are not observed in the data, the estimation strategy controls for transfers received from coresiding children by controlling for coresidency.

¹⁵ Note that we are still assuming that the parent's threat point is determined by the utility the parent would receive if living alone. In the case of multiple children this is no longer the only possible threat point. That is, it is possible that in fact if the parent did not live with the current child, s/he may live with one of the other children. The parent may in fact argue this so as to strengthen his/her bargaining position within the household. If this is the case, then the parent's labor supply decision in the case where s/he coresides would include that child's characteristics. We however have no way of determining which child would be ranked next, and also whether living with that child would be more attractive to the parent than living alone. One option would be to include the characteristics of all non-coresiding children in the labor supply equation for coresiding parents. This however produces a labor supply equation that relies on functional form for identification. The utility obtained through living alone is at least indicative of the gains the parent receives from coresiding and can be justified theoretically on the grounds that the coresiding child may have imperfect information as to whether his/her siblings would be prepared to have the parent live with them and so treats the possibility as a non-binding threat point. In practical terms, this assumption means that non-coresiding children are restricted to affect their parent's labor supply only via the transfers they make to the parent.

The Coresidency Decision:

As above, the coresidency decision is a function of the utility obtained in each of the two possible states.¹⁶ It hence includes all of the variables in the system. In addition, for the purpose of identification we include the vector of variables H (local average housing prices and average house size) that affect coresidency directly but do not directly determine transfers or labor supply.¹⁷ The coresidency equation is hence:

$$C = \eta_0 + \eta_1 Z^P + \eta_2 Z^C + \eta_3 H + v_5. \quad (18)$$

The two transfer equations (15) and (17), the two labor supply equations (13) and (17), and the coresidency equation (18) comprise our empirical model. These five equations are estimated jointly using maximum likelihood estimation with the censoring taken into account. The estimation is performed separately for men and women because we expect the determinants of labor supply and transfers to vary with gender. Before we turn to the results of this estimation however, we discuss the data.

5 The Indonesian Family Life Survey

The IFLS is a general household survey. It provides data from 1993 on a random sample of 7,224 households across the Indonesian provinces in Java, Sumatra, Bali, West Nusa Tenggara, Kalimantan and Sulawesi. This study will focus on Indonesians aged 60 years or over¹⁸ and within these 7,224 households there are 2625 individuals in this age category. Information was gathered on all household members, however more detailed information was collected for selected householders and is available for 1891 elderly individuals.¹⁹ Because we are interested in examining the relationship between the labor supply of the elderly and the amount of financial support they receive from their children, we will focus on the sample of 1507 individuals who report having at least one living child over the age of 18. Dropping observations which have missing values for one or more of the explanatory variables results in a sample size of 1430.

The IFLS asks respondents how many hours they worked last week, how many hours they usually work per week and how many weeks they usually work per year. We thus have three potential measures of the elderly parent's labor supply: hours last week, normal hours per week and a constructed measure of annual hours (normal hours per week

¹⁶ Note that Pezzin and Schone (1990) consider nursing home care as an additional form of living arrangement. Such care is very rarely available in Indonesia and so is not modelled here.

¹⁷ Otherwise it would only be identified by the functional form of the parameter.

¹⁸ In 1993 the average life expectancy in Indonesia was 63 (World Bank, 1995).

¹⁹ These are elderly individuals who were able to provide information on non-coresiding children. This data is only available for the elderly who could answer the questions themselves. Our sample may thus under-represent the elderly who were particularly frail or disabled.

multiplied by normal weeks per year).²⁰ We investigated all three measures and found the results strikingly similar. Our attention will focus on normal weekly hours because this measure is less sensitive to any seasonality effects reflected in hours last week and is more interpretable than the annual hours measure.²¹

The IFLS is unusual in that it provides relatively detailed data on all of the living non-coresiding children of the elderly parent. This includes data on the age, gender, marital status, educational attainment of the children and whether they live in the same province as the parent.²² This general demographic data is also available for the parent and the coresiding children. Another attractive feature of the IFLS is that it provides information about the amount of money children have transferred to their parents in the 12 months preceding the survey.

We are also fortunate in that the IFLS provides information about the labor market sector (self-employed, government, private industry, not employed) in which the parent worked 20 years ago. Unlike current sector of employment, this variable is not a function of current labor supply, but is likely to reflect both the availability of current employment opportunities and aspects of the elderly individual's taste parameters that may not be captured by education and the other demographic variables in the analysis. Summary statistics and variable definitions are shown in appendix table A1.²³

Table 1 shows the living arrangements of the elderly in Indonesia. The majority (62.5 percent) of Indonesian parents over the age of 60 are living with one or more of their

²⁰ Specifically, normal hours per week is the response to the following question "Normally what is the approximate total number of hours you work per week?"

²¹ The relationship between the annual hours measure and the explanatory variables was a little weaker than for the other hours measures. We also plotted kernel density estimates of the two weekly hours measures which showed the distribution of the two measures to be very similar. The IFLS asks people about the hours they normally worked on their primary job and their secondary job. We summed these two figures to arrive at the total hours normally worked. A small but not insignificant percentage of the sample reported working long hours on both jobs such that the total hours worked was not feasible. As a result normal hours worked was top-coded at 84 hours per week. We experimented with allowing for this upper censoring using a tobit model and found that it made little difference. The MLE results below control for lower censoring only.

²² Indonesia had 27 provinces in 1993.

²³ Most of the variables used are self-explanatory. Those that are not are: other income which is defined as the sum of pension income, asset income and any other non-labor income received by the individual in the 12 months prior to the survey (but not transfer income). Assets are the assets owned by the individual (including the appropriate percentage of shared assets) and include houses/buildings, land, animals, vehicles, appliances, savings, stocks, receivables, jewelry and any other assets. The parental education categories are dummy variables that reflect the highest level of school attended by the individual. In the case of children they reflect the number of children in each schooling category. An individual is classified as being married if s/he is not never married, divorced, separated or widowed. The previous sector of employment variables are dummy variables which reflect the sector of employment of the individual's primary job 20 years ago. The variable "Out of Province" is the number of children who live in a different province to the parent. The average house price and house size are the village averages as reported by the village head. The dependent variable in the transfers equation is the sum of transfers received from all non-coresiding children in the 12 months prior to the survey.

children. These are the parents who we will designate as “coresiding”. A further 21.3 percent are living with their spouse, with only 7.0 percent living alone. Thus, “non-coresiding” is not synonymous with living alone.

Table 1: Living Arrangements of the Indonesian Elderly

Living Arrangement (N=2625)	Percentage of elderly (%)
Living with adult children	62.51
Living with spouse and others (not children)	7.60
Living with others (not spouse or children)	9.02
Living with spouse only	13.67
Living alone	7.03

* Appropriate sampling weights were used to derive the figures in this table. Source: Cameron (2000).

Transfers from non-coresiding children are on average larger to mothers than to fathers, particularly if the mother is not living with one of her children. (See Table 2.) Overall, more than one in two elderly parents received a positive transfer from their children in the previous year. Although on average the sums of money transferred are not very large (on average the equivalent of US\$71), this amount does represent a large share of mean household income and an even larger share of mean personal income, particularly for non-coresiding parents.

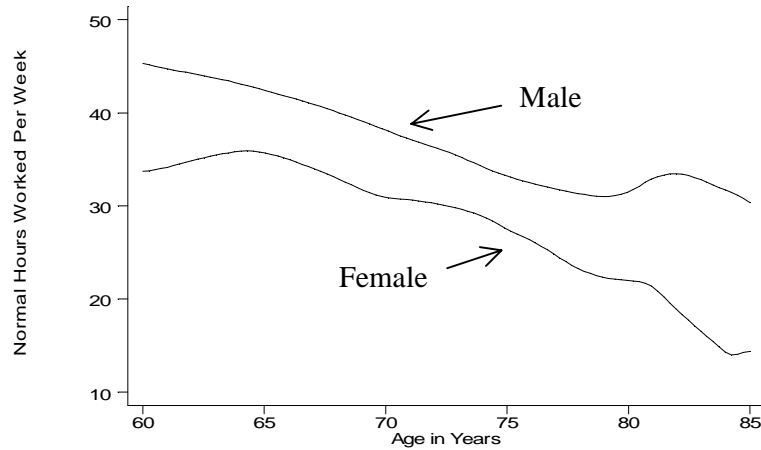
Table 2: Mean Transfers, Proportion Receiving Transfers, and Hours of Work by Coresidency Status and Gender

	Women		Men	
	Coreside		Coreside	
	No	Yes	No	Yes
Mean Annual Transfers (Rp thousand)	224.4	158.5	168.3	174.9
Proportion Receiving Transfers (%)	72.3	51.5	62.6	56.6
Mean Transfers/Mean Household Income (%)	36.4	6.7	25.6	11.6
Mean Transfers/Mean Individual Income (%)	123.4	43.1	30.3	15.4
Mean Normal Weekly Hours Worked	17.6	13.5	34.1	23.6

Table 2 also provides information about the normal weekly hours of work of Indonesia elderly. These results indicate that many Indonesian men and women remain economically active into their old age. Not surprisingly, elderly men work on average more hours than elderly women, and younger age-cohorts are working slightly more hours than are older age-cohorts (See Figure 1). Men who do not live with one or more of their children normally work an average of 34.1 hours each week, with coresiding men

working somewhat less (23.6 hours per week). Indonesian women work on average half the hours worked by men, which translates into a smaller gap between coresiding women (13.5 hours per week) and non-coresiding women (17.6 hours per week).

Figure 1: Labor Supply by Age and Gender



6 Coresidency, Transfers, and Labor Supply as Sources of Old-Age Support

As discussed above, our theoretical framework suggests an empirical model in which transfers receipt and labor supply decisions depend on the elderly parent's coresidency status. In order to account for simultaneity between these three forms of old-age support, the coresidency, transfers, and labor supply equations are estimated jointly using maximum likelihood estimation. These results are discussed below. Parallel results assuming that these forms of support are exogenous are presented in Appendix tables A2 and A3.

Coresidency Among Indonesian Elderly:

Elderly individuals are defined to be coresiding ($C = 1$) if they live with one or more adult children and non-coresiding ($C = 0$) otherwise.²⁴ Coresidency is more a function of

²⁴ Similarly, children are defined to be coresiding if they live with the parent, and non-coresiding if not. Note that it is possible for a non-coresiding child to have a coresiding parent. This simply implies that the parent lives with one of the child's siblings rather than on his or her own.

children's characteristics and parental income than parental characteristics. (See Table 3.)

Table 3: The Determinants of Coresidency for Elderly Indonesians
Based on Joint Model of Coresidence, Transfers, and Labor Supply
(Probit Marginal Effects and Standard Errors)

	Women		Men	
	Marginal Effect	Standard Error	Marginal Effect	Standard Error
Parents Income				
Other Income (Rp10 ⁶)	-0.096	(-3.71)	-0.022	(-1.16)
Assets (Rp10 ⁶)	-0.001	(-1.91)	0.001	(1.39)
Parents Characteristics				
Age	-0.011	(-3.41)	-0.001	(-0.16)
Married	-0.067	(-1.57)	-0.005	(-0.08)
Disabled	0.083	(1.24)	-0.046	(-0.50)
Primary Education	-0.029	(-0.58)	-0.018	(-0.42)
Secondary/Tertiary Education	-0.074	(-0.72)	((0.09)
Rural	-0.083	(-1.73)	-0.028	(-0.54)
Previous Work Status				
Self-Employed	-0.068	(-1.57)	-0.140	(-2.17)
Government	0.037	(0.21)	-0.109	(-1.04)
Private	-0.100	(-1.40)	-0.084	(-1.14)
Children's Characteristics				
Married	-0.002	(-0.17)	0.016	(1.53)
Not Married	0.150	(6.45)	0.177	(8.69)
Secondary Education	0.037	(2.61)	0.003	(0.20)
Tertiary Education	-0.023	(-0.93)	-0.054	(-2.16)
Local Housing Market				
Average House Price (Rp10 ⁶)	0.036	(1.73)	0.080	(3.80)
<u>N</u>	720		709	

In particular, mothers' assets²⁵ and non-earned income are negatively related to their probability of coresiding—suggesting an ability to buy privacy—but the effect is very

²⁵ We treat assets as a pre-determined variable. It can be argued that assets are actually endogenous as the parent may run them down if s/he does not receive income support from other sources. We examined the asset data however and found no evidence of asset values changing systematically, either increasing or decreasing, with age over 60. We also estimated the entire system of equations without the inclusion of the asset variable and found none of the other parameters to be affected by its presence. We chose to present the results that include the asset variable because theoretically wealth could play an important role in the choices elderly individuals make regarding their income support.

small in magnitude.²⁶ An extra Rp200,000 of non-earned income (approximately doubling the average) decreases the probability of coresiding by less than 2 percentage points.²⁷ Assets and non-earned income are not significantly related to the coresidency status of elderly fathers, however

Age has a strongly significant negative effect on the probability that women coreside, but is unrelated to the coresidency status of elderly men. Aging 10 years decreases the probability of elderly women coresiding by more than ten percentage points. This negative relationship may suggest that Indonesian children are more often living with their mothers than the converse. As mothers (and children) age, children are more likely to move out. The IFLS data do not allow us to establish who is living with whom. Even if we knew a lot more about the household this would be difficult to ascertain because over time we would expect that responsibility would shift gradually from the mother to the child in either case.²⁸ It is also possible that—given the nature of the data—we are capturing the effects of birth-cohorts rather than aging. Frankenburg, Beard and Saputra (1999) however used panel data for Indonesia and similarly found age to be negatively related to the *transition* to coresidency.²⁹

The coefficients on children's characteristics reinforce the story that coresidency is more a result of evolving household structure and children aging than an explicit form of old-age support. Parents are significantly more likely to be living with unmarried children (who are less likely to have moved out of the parental home) than married children. Fathers are significantly less likely to be coresiding with tertiary educated children, while mothers are significantly more likely to be coresiding with children with a secondary education.

Fathers who were self-employed 20 years ago are 14 percentage points less likely to be coresiding than other fathers. Previous work sector is included in the coresidency equation because of its potential effect on labor supply and because of the need to include all of the variables in the system of equations in the coresidency equation. It is not clear from this reduced form coresidency equation whether the negative effect of prior self-employment status on coresidency occurs because these fathers are more likely to be currently employed (see below) or is due to some other reason. We do know however that there is a strong correlation between rural residency and being self-employed 20 years ago, presumably because many of the self-employed were farmers. In contrast to previous studies of coresidency in Indonesia, the rural/urban status of the household was found not to be a significant determinant of coresidency—at least for fathers. It was

²⁶ Unearned income is defined to equal the sum of pension income, asset income and any other non-labor income other than transfers.

²⁷ The Indonesian currency is the Rupiah. In 1993 US\$1 bought approximately Rp2500.

²⁸ We have defined adult children to be children aged over 18. Restricting the definition of coresidency to be living with a child aged over 25 does not change the negative effect of age. Given that our sample of parents is over the age of 60, the majority of the children in the sample are older than this in any case.

²⁹ Their study covered a four-year period. We tried including a quadratic in age but it was insignificant.

however strongly significant before the inclusion of employment status. Employment status thus appears to be picking up the effect of rural residence.

Importantly for the identification of the coresidency equation, average house price in the parent's locality is significantly related to the probability of coresidence (at the one percent level for men and the ten percent level for women) and it has the expected positive sign. Living in a more expensive area increases the probability of coresidency.

Transfers to Indonesian Elderly from Non-Coresiding Children:

The determinants of transfers to their elderly parents are presented in Table 4.³⁰ For ease of interpretation we focus on the resulting marginal effects rather than the coefficient estimates directly.³¹

Although there is evidence that transfers are targeted to the elderly population as a whole (Secondi, 1997; Ravallion and Dearden, 1988), our analysis suggests that within the elderly population financial transfers from children are not in general related to parental need as measured by the elderly parent's own characteristics.³² Disabled and older parents do not receive any more in transfers than their able-bodied, younger counterparts. Older, coresiding fathers actually receive less with transfers falling by approximately 10,000 rupiah for each year the father ages, though this effect is significant at only the ten percent level.³³ Furthermore, wealthier mothers receive significantly more transfers from their non-coresiding children. Increasing asset levels by Rp 1,000,000 (18 percent of the mean asset level) results in transfers increasing by as much as 105,000 rupiah each year. Other studies have found similar results and on this basis have rejected altruism as a motivation for transfers (Cox and Rank (1992) for example). Finally, there is generally a positive relationship between transfers and parental education among those mothers and fathers coresiding with adult children. Only among non-coresiding parents does it appear to be the case that transfers are targeted towards less educated—and perhaps more disadvantaged—parents.

Similarly, for coresiding parents there is little evidence that transfers respond to parental need as measured by the characteristics (number and education level) of coresiding

³⁰ The IFLS also provides information on transfers to children from parents. We experimented with subtracting this amount from transfers from children and using a net measure of transfers that would then not be censored at zero. It however seems that the motivations for these two types of transfers differ significantly. Using the net measure of transfers instead of the gross measure significantly reduced the predictive power of the transfers equation. For the elderly transfers from children are much more quantitatively important than transfers in the other direction. We hence elected to use gross transfers to parents as our measure of transfers.

³¹ Marginal effects are calculated at the means.

³² Ravallion and Dearden (1988) model both the magnitude and direction of gross and net financial transfers and find that in both the rural and urban areas of Java private transfers between individuals are targeted towards the disadvantaged, including the elderly.

³³ Given the cross-sectional nature of our data, this pattern may reflect differences across birth-cohorts rather than the effects of aging per se.

children.³⁴ Transfers from non-coresiding children to their fathers are lower as the overall number of unmarried coresiding siblings increases, but otherwise there is little relationship between the number of coresiding siblings and transfers. In fact, non-coresiding children appear to transfer more when their coresiding siblings have higher education levels (and presumably greater earnings capacity), though this effect is only marginally significant.

Table 4: Transfers (in Rp 1000) from Non-Coresiding Children for Indonesian Elderly
Based on Joint Model of Coresidence, Transfers, and Labor Supply
(Marginal Effects and t-statistics)

	Coreside		Non-Coreside		Coreside		Non-Coreside	
	Women		Women		Men		Men	
Parental Resources								
Other Inc. (Rp10 ⁶)	46.4	1.95	105.4	2.49	51.8	2.56	37.6	0.91
Assets (Rp10 ⁶)	1.9	3.51	2.6	1.82	-0.1	-0.12	2.4	1.32
Parental Characteristics								
Age	0.8	0.23	3.1	0.69	-10.4	-1.94	-3.1	-0.66
Education ^a :								
Primary	88.0	2.04	8.7	0.12	130.6	2.36	-146.8	-2.52
Secondary	313.3	2.92	-376.4	-2.41	6.4	0.05	-222.0	-1.77
Married ^b	-108.7	-2.74	-175.7	-2.72	-2.0	-0.02	15.4	0.15
Disabled	-1.5	-0.03	-19.1	-0.18	-74.9	-0.56	7.2	0.06
Rural	83.5	2.14	-46.0	-0.74	125.0	2.10	119.5	1.62
Outside	-2.4	-0.14	22.1	0.89	28.8	1.09	13.1	0.56
Previous Work Status ^c								
Self-Employed	7.9	0.19	-71.1	-1.17	135.2	1.54	-8.2	-0.08
Government	-310.5	-1.69	559.9	2.35	-86.5	-0.53	-43.6	-0.28
Private	-41.4	-0.58	-204.2	-1.94	50.3	0.53	1.2	0.01
Coresiding Children's Characteristics								
Married	21.6	0.49			55.1	0.84		
Not Married	-5.9	-0.19			-213.8	-4.97		
Secondary Educ.	-13.6	-0.43			-27.2	-0.57		
Tertiary Educ.	79.9	1.80			179.3	1.86		
Non-Coresiding Children's Characteristics								
Married	77.9	6.45	63.2	4.09	49.5	2.85	33.9	2.18
Not Married	52.0	1.71	164.3	3.84	-23.5	-0.65	-53.7	-0.97
Secondary Educ.	2.6	0.19	2.2	0.10	29.8	1.13	70.7	3.09
Tertiary Educ.	42.1	1.43	62.2	1.69	98.6	1.81	52.6	1.29

³⁴ Note that the characteristics of coresiding children are relevant only when parents coreside.

Constant	-59.4	-0.24	291.0	0.87	1079.2	2.54	166.5	0.44
N	418		302		407		302	

^a Relative to no education.

^b Currently living with spouse.

^c Work status 20 years ago. The omitted category is not at work.

^d Number in each category.

Just as transfers from non-coresiding Indonesian children to their elderly parents are in the main not responsive to parental need as captured by the characteristics of parents and coresiding siblings, they are also appear to be only loosely related to the ability to give. While unmarried children (who most likely have fewer dependents) transfer more each year to their non-coresiding mothers than do their married siblings, they make smaller transfers to their fathers and coresiding mothers. Furthermore, there is little relationship between non-coresiding children's education levels and the transfers they provide mothers and fathers. Children with a tertiary education do transfer significantly more to their parents than children with no education, though this effect is significant only at ten percent and does not exist across the board suggesting that there may be little relationship between the earnings of non-coresiding children and transfers to their parents.

These findings are consistent with the notion that norms about fairness in parental support and/or altruism are important determinants of transfers from children to parents. To some extent, the results above are also consistent with Lillard and Willis's (1997) work on the motives for intergenerational transfers in Malaysia. With the elderly couple the unit of analysis, they find only limited support for the view that the provision of old-age security is the motive behind the transfers received from non-coresiding children. Specifically, they find no relationship between the age of the elderly couple and the amount of transfers received and increases in the father's income result in larger rather than smaller financial transfers. Any provision of old-age support appears to be targeted towards mothers, particularly those who are widowed or in ill health.³⁵

The Labor Supply of Indonesian Elderly:

Our results provide little evidence that financial transfers from Indonesian children are a substitute for the income support provided by the elderly parent's own labor supply. (See Table 5.) Transfers are negatively and significantly related to normal weekly hours of work only for non-coresiding mothers. In addition, this effect is small—doubling transfers leads to a 3.7 hour (21 percent) reduction in normal weekly hours.

Like transfers, asset levels and unearned income also appear to play little part in the labor-supply decisions of elderly Indonesians. Elderly individuals with higher asset

³⁵ Lillard and Willis (1997) also conclude that coresidency is exogenous to the transfer decision but that coresiding fathers are more likely to receive transfers than are non-coresiding fathers. They find that coresidency does not affect the amount of transfers received by mothers.

levels or with more unearned income do not enjoy significantly more leisure in their old age. To some extent these results may occur because pension income is being captured largely by previous work status. Very few individuals other than government officials receive pension income in Indonesia and both men and women who were government employees 20 years ago work significantly less in their old age than individuals previously employed in other sectors of the labor market. For example, coresiding women who were previously employed as a government work on average 12.4 hours per week less in their old age than women who were self-employed and 8.2 hours less than women who were private employees. In addition, previous labor market sector may also control for the opportunity for continued employment. Self-employed individuals for instance may be able to continue to generate their own employment opportunities into their old age, while individuals not previously employed may have very limited labor market opportunities. Rural/urban status is likely to further capture both the opportunity for and returns to employment. Everything else equal, non-coresiding elderly women and coresiding elderly men work more hours in rural labor markets than in urban areas.

Table 5: Determinants of Weekly Normal Hours of Work for Indonesian Elderly
Based on Joint Model of Coresidence, Transfers, and Labor Supply
(Marginal Effects and t-statistics)

	Coreside		Non-Coreside		Coreside		Non-Coreside	
	Women		Women		Men		Men	
Parental Resources								
Transfers (Rp10 ³)	-0.001	-0.19	-0.017	-1.94	-0.007	-0.80	-0.042	-0.54
Other Inc. (Rp10 ⁶)	1.592	1.47	0.733	0.26	0.024	0.02	9.365	0.49
Assets (Rp10 ⁶)	-0.002	-0.08	-0.005	-0.06	0.043	1.13	-4.722	-0.62
Parental Characteristics								
Age	-0.653	-3.35	-0.447	-1.69	-1.413	-5.47	-1.468	-6.73
Education ^a :								
Primary	0.520	0.26	2.309	0.79	-4.046	-1.22	-5.065	-1.81
Secondary	4.481	0.96	-17.962	-2.32	-8.175	-1.38	-11.950	-2.14
Married ^b	3.083	1.86	-1.306	-0.48	5.683	1.06	7.656	1.65
Disabled	-6.748	-2.32	-13.560	-2.62	-20.819	-3.48	-6.074	-1.08
Rural	-0.216	-0.12	5.866	1.93	5.307	1.70	0.889	0.29
Previous Work Status ^c								
Self-Employed	15.818	7.19	14.308	5.22	14.422	3.23	18.828	4.02
Government	3.362	0.38	24.072	1.91	-6.963	-1.17	-3.679	-0.52
Private	11.557	3.79	19.548	4.59	11.525	2.58	11.412	2.22
Coresiding Children's Characteristics								
Married	0.360	0.18			-0.916	-0.34		
Not Married	0.732	0.52			-0.567	-0.24		
Secondary Educ.	-1.863	-1.35			-0.246	-0.13		
Tertiary Educ.	-0.835	-0.31			-5.491	-1.49		
Constant	30.567	2.45	36.133	1.59	102.763	4.64	103.765	5.98
N	418		302		407		302	

^a Relative to no education.

^b Currently living with spouse.

^c Work status 20 years ago. The omitted category is not at work.

^d Number in each category.

The labor-supply behavior of the Indonesian elderly is also related to the capacity for market work. For example, normal hours of work decline between 1.5 and 0.7 hours per week with each year of age. Gender differences in the effects of age on labor supply suggest a convergence in the hours of work of elderly men and women as they age. Furthermore, disabled individuals work as many as 20.8 fewer hours per week.³⁶

At the same time, to the extent that market wages increase with the level of education, our results imply that among non-coresiding men and women it is those individuals facing the lowest returns to market work (but perhaps the greatest need) who continue to work into their old age. Coresiding men and women's hours of work do not vary significantly with education whereas among elderly Indonesians who do not coreside with an adult child hours of work decrease with more education. Specifically, non-coresiding men with no education at all are predicted to work 12.0 hours more per week than non-coresiding men with at least a secondary school education. Among non-coresiding women the difference is even higher (18.0 hours).

For both men and women the characteristics of coresiding children have no effect on the number of hours their parents work each week. This is particularly striking since it seems to suggest that overall household resources—as reflected by the numbers of adult children and their education levels—is unrelated to the labor-supply decisions of elderly parents. Controlling for the number of adult coresiding children (i.e., the number of married and non-married children), elderly parents who live with children who are relatively better educated (and therefore presumably have higher earnings) do not work less in their old age.³⁷

7 Conclusions:

This paper considers the determinants of the labor supply of Indonesian elderly allowing labor supply to be simultaneously determined along with coresidency and the receipt of transfers. Our goals were to: 1) examine the quantitative importance of each of these three forms of support, 2) to establish whether transfers and coresidency are responsive to the needs of the parents and the ability of the children to give, 3) to identify the determinants of elderly labor supply and 4) to examine the relationship between these three forms of support.

³⁶ Individuals are classified as disabled if they report having difficulty standing from sitting, dressing or going to the bathroom by themselves.

³⁷ Interactions between children's marital status and gender were insignificant.

Our results indicate that all three forms of old-age support appear to be prevalent and quantitatively important. However coresidency appears to be a result of evolving household structure, rather than an explicit form of support for elderly parents. Transfers from non-coresiding Indonesian children to their elderly parents do not seem to be strongly related to parental need as captured by the parent's own characteristics and the characteristics of coresiding siblings. Nor do transfers appear to be strongly related to the ability to give as measured by non-coresiding children's characteristics. These results may be consistent with attempts to ensure fairness in or sharing of resources across siblings as the primary transfer motive.

Financial transfers from Indonesian children do not appear to be a substitute for the income support provided by the elderly parent's own labor market work. Only non-coresiding women reduce their hours of work as their children's transfers become more generous. The labor supply of coresiding elderly parents is also unrelated to the characteristics of their coresiding children. This is particularly striking since it seems to suggest that overall household resources—as reflected in the numbers of adult children and their education levels—is unrelated to the labor supply decision of the elderly parent.

We can only speculate about why the labor supply of elderly Indonesians does not appear more responsive to the support provided in the form of transfers or through coresidency. One possibility, is that the value of this support is not large enough—or may be too unpredictable—to play an important role in an elderly person's labor supply decision. Alternatively, there may be either cultural or emotional motivations for continuing to work into old age.

REFERENCES

- Adlakha, A. and D. Rudolph (1994) "Aging Trends: Indonesia", *Journal of Cross-Cultural Gerontology*, 9, pp99-108.
- Altonji, J., F. Hayashi and L. Kotlikoff (1994), "Parental Altruism and Inter Vivos Transfers: Theory and Evidence", unpublished paper, pp.1-56.
- Becker, G. (1974), "A Theory of Social Interactions", *Journal of Political Economy*, 82(6), pp1063-93.
- Becker, G. (1993), *A Treatise on the Family*, Cambridge, MA: Harvard University Press.
- Bernheim, D., Shleifer, A. and L. Summers (1985), "The Strategic Bequest Motive", *Journal of Political Economy*, 93, pp 1045-1076.
- Bound, J., D.A. Jaeger, and R.M. Baker (1997). "Problems with Instrumental Variables Estimation When the Correlation Between the Instruments and the Endogenous

- Explanatory Variable is Weak”, *Journal of the American Statistical Association*, 90(430), pp 443-450.
- Cain, M. (1991), “The Activities of the Elderly in Rural Bangladesh”, *Population Studies*, 45, pp189-202.
- Cameron, L. (2000), “The Residency Decision of Elderly Indonesians: A Nested Logit Analysis”, *Demography*.
- Cox, D. and E. Jimenez (1992), “Social Security and Private Transfers in Developing Countries: The Case of Peru”, *World Bank Economic Review*, 6(1), pp155-169.
- Cox, D. (1987), “Motives for Private Income Transfers”, *Journal of Political Economy*, 95(3), pp 508-543.
- DaVanzo, J. and A. Chan. 1994. ”Living Arrangements of Older Malaysians: Who Coresides with Their Children?” *Demography* 31(1):95-113.
- Davidson, R. and J. MacKinnon (1993), *Estimation and Inference in Econometrics*. Oxford University Press, New York.
- Deaton, A. and C. Paxson (1995), “Measuring Poverty among the Elderly”, Working Paper, Research Program in Development studies, Princeton University.
- Engers, M. and S. Stern (1998), “Long Term Care and Family Bargaining”, Working Paper, University of Virginia, pp1-67.
- Evans, J. 1990. “The Economic Status of Older Men and Women in the Javanese Household and the Influence of this upon their Nutritional Level.” *Journal of Cross-Cultural Gerontology* 5:217-242.
- Frankenburg, E., Beard, V. and M. Saputra (1999), “The Kindred Spirit: The Ties that Bind Indonesian Children and their Parents”, *Southeast Asian Journal of Social Science*, 27(2), pp65-86.
- Hanoch, G. and M. Honig (1983), “Retirement, Wages, and Labor Supply of the Elderly”, *Journal of Labor Economics*, 1(2), pp131-151.
- Hiedemann, B. and S. Stern (1998), “Strategic Play Among Family Members when Making Long-Term Care Decisions”, Working Paper, University of Virginia, June, pp1-41.
- Hoddinott, J. (1992), “Rotten Kids or Manipulative Parents: Are Children Old Age Security in Western Kenya?”, *Economic Development and Cultural Change*, 40, pp545-566.
- Hoerger, T., Picone, G. and F. Sloan (1996), “Public Subsidies, Private Provision of Care and Living Arrangements of the Elderly”, *Review of Economics and Statistics*, pp428-440.
- Jensen, R. (1996), “Public Transfers and Migrant Remittances: Theory and Evidence from South Africa”, unpublished paper, pp1-35.
- Kim, I. and E. Choe. 1992. “Support Exchange Patterns of the Elderly in the Republic of China.” *Asia-Pacific Population Journal* 7(3):89-104.
- Khemani, S. (1999), “Inter-generational Transfers and Intra-household bargaining: evidence from Indonesia”, unpublished paper, pp1-44.
- Kochar, A. (1997), “Evaluating Familial Support for the Elderly: The Intra-Household Allocation of Medical Expenditures in Rural Pakistan”, unpublished paper.

- Lillard, L. and R. Willis (1997), "Motives for Intergenerational Transfers: Evidence from Malaysia", *Demography*, 34(1), pp 115-134.
- Maddala, G.S. 1983. *Limited Dependent and Qualitative Variables in Econometrics*. Econometric Society Monograph No. 3. Cambridge, U.K.: Cambridge University Press.
- Martin, L. 1988. "The Aging of Asia." *Journal of Gerontology* 43:S99-113.
- Martin, L. 1989. "Living Arrangements of the Elderly in Fiji, Korea, Malaysia and the Philippines." *Demography* 26:627-44.
- McGarry, K. and R. Schoeni (1995), "Transfer Behavior in the Health and retirement Study: Measurement and the Redistribution of Resources within the Family", *Journal of Human Resources*, XXX, pp. S186-S226.
- Niehof, A. (1995), "Ageing and the Elderly in Indonesia: Identifying the Key Issues", Pezzin, L. and B. Schone (1996), "Intergenerational Transfers of Time and Elderly Living Arrangements: A Bargaining Model of Family Resource Allocation Decisions", unpublished paper.
- Pezzin, L. and B. Schone (1997), "The Allocation of Resources in Intergenerational Households: Adult Children and Their Elderly Parents", *American Economic Review*, AEA Papers and Proceedings, 87(2), pp460-464.
- Ravallion, M. and L. Dearden (1988), "Social Security in a 'Moral Economy': An Empirical Analysis for Java", *Review of Economics and Statistics*, 70, 36-44.
- Rosenzweig, M. and K. Wolpin (1993), "Intergenerational Support and the Life-Cycle Incomes of Young Men and Their Parents: Human Capital Investments, Coresidence, and Intergenerational Transfers", *Journal of Labor Economics*, 11(1), pp84-112.
- Rudkin, L. 1994. "Dependency Status and Happiness with Old Age on Java." *The Gerontologist* 34(2):217-223.
- Rudkin, L. 1993. "Gender Differences in Economic Well-Being Among the Elderly of Java." *Demography* 30(2):209-226.
- Secondi, G. (1997), "Private Monetary Transfers in Rural China. Are Families Altruistic?", *Journal of Development Studies*, 33(4), pp487-511.
- Wolf, D. and B. Soldo. 1988. "Household Composition Choices of Older Unmarried Women." *Demography* 25(3):387-403.
- World Bank. 1995. *The World Development Report*. New York: A World Bank Publication, Oxford University Press.

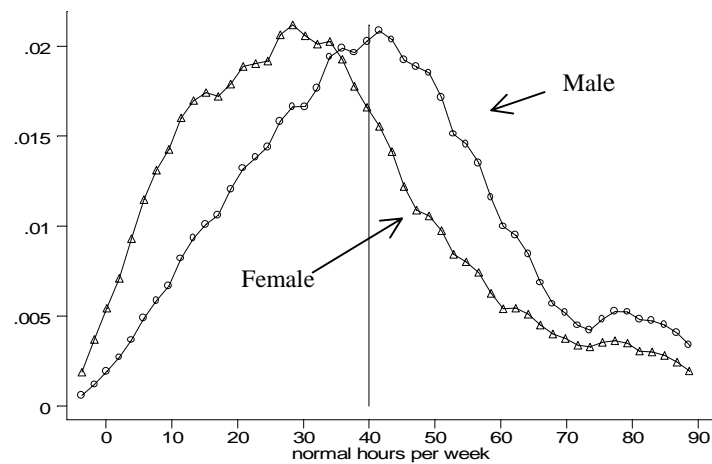
Appendix Table 1:
Mean Parental and Child Characteristics by Gender and Coresidency

	Women		Men	
	Non- Coresiding	<u>Coresiding</u>	Non- Coresiding	Coresiding
Parental Income/Wealth				
Other Income(Rp10 ⁵)	Rp1.311	Rp1.641	Rp1.398	Rp2.833
Assets(Rp10 ⁶)	Rp3.923	Rp5.318	Rp3.696	Rp7.909
Parent's Characteristics ^a				
Age (years)	67.3	65.1	66.9	66.0
Primary	0.23	0.26	0.55	0.54
Secondary/Tertiary	0.05	0.04	0.07	0.13
Married	0.40	0.46	0.91	0.92
Disabled	0.09	0.10	0.05	0.05
Rural	0.65	0.54	0.74	0.59
Previous Employment Sector ^a				
Self-Employed	0.41	0.31	0.65	0.53
Government	0.01	0.01	0.06	0.10
Private	0.10	0.08	0.19	0.23
Not Employed	0.47	0.60	0.10	0.14
Non-Coresiding Children's Characteristics ^b				
Married	3.2	2.6	2.9	2.6
Not Married	0.4	0.3	0.5	0.3
Primary Education	2.5	1.6	2.3	1.6
Secondary Education	0.9	1.1	1.0	1.1
Tertiary Education	0.2	0.2	0.2	0.2
Out of Province	0.9	0.7	0.9	0.7
Coresiding Children's Characteristics ^b				
Married		0.6		0.5
Not Married		0.8		1.2
Primary Education		0.7		0.8
Secondary Education		0.6		0.7
Tertiary Education		0.1		0.1
Local Housing Market				
Average House Price(Rp10 ⁶)	Rp8.208	Rp13.300	Rp6.146	Rp14.100
Average House Size (sqm)	73.1	81.1	76.4	83.4
N	292	421	305	412

^a Unless otherwise specified, these are dummy variables.

^b Numbers of children in each category.

Figure A1: Kernel Density Estimate of Normal Hours Per Week



Appendix Table 2

Transfers from Non-Coresiding Children for Indonesian Elderly Based on Single Equation Model (Tobit Marginal Effects and t-statistics)

EXOGENOUS

	Coreside Women		Non-Coreside Women		Coreside Men		Non-Coreside Men	
Parental Resources								
Other Inc. (Rp10 ⁶)	24.712	(0.86)	157.681	(3.22)	35.999	(2.04)	28.573	(0.81)
Assets (Rp10 ⁶)	1.907	(2.21)	2.988	(1.90)	0.326	(0.44)	1.844	(1.48)
Parental Characteristics								
Age	-3.898	(-1.06)	6.746	(1.30)	-6.871	(-1.52)	-3.163	(-0.66)
Education ^a :								
Primary	82.558	(1.71)	30.436	(0.37)	70.216	(1.24)	-153.667	(-2.63)
Secondary	278.218	(2.81)	-330.425	(-1.84)	-30.896	(-0.31)	-213.905	(-1.69)
Married ^b	-118.664	(-2.76)	-110.894	(-1.51)	84.425	(0.90)	8.940	(0.09)
Disabled	29.374	(0.45)	-42.426	(-0.34)	-58.448	(-0.51)	3.880	(0.03)
Rural	62.667	(1.44)	15.122	(0.20)	14.087	(0.25)	111.318	(1.60)
Outside	3.855	(0.20)	24.796	(0.86)	-6.014	(-0.26)	15.899	(0.67)
Previous Work Status ^c								
Self-Employed	2.272	(0.05)	-27.456	(-0.39)	28.855	(0.38)	-13.692	(-0.14)
Government	-293.847	(-1.47)	504.717	(1.78)	-53.855	(-0.50)	-43.171	(-0.28)
Private	-39.443	(-0.52)	-94.005	(-0.81)	42.740	(0.52)	4.143	(0.04)
Coresiding Children's Characteristics								
Married	16.736	(0.36)			70.637	(1.43)		
Not Married	33.251	(0.99)			12.922	(0.38)		
Secondary Educ.	-9.929	(-0.29)			-16.499	(-0.43)		
Tertiary Educ.	59.763	(0.92)			93.943	(1.54)		
Non-Coresiding Children's Characteristics								
Married	71.633	(5.67)	67.844	(3.82)	59.779	(3.94)	33.216	(2.17)
Not Married	79.218	(2.51)	102.731	(2.10)	79.903	(2.50)	-43.883	(-1.22)
Secondary Educ.	3.626	(0.22)	4.522	(0.17)	26.080	(1.21)	77.383	(3.53)
Tertiary Educ.	21.109	(0.58)	22.629	(0.50)	37.295	(0.95)	41.694	(1.06)
Constant	-9.780	(-0.04)	408.573	(-1.10)	19.110	(0.05)	213.975	(0.58)
N	418		302		407		302	

^a Relative to no education.^b Currently living with spouse.^c Work status 20 years ago. The omitted category is not at work.^d Number in each category.

Table A3: Determinants of Weekly Normal Hours of Work for Indonesian Elderly Based on Single Equation Model (Marginal Effects and t-statistics)

	Coreside		Non-Coreside		Coreside		Non-Coreside	
	Women		Women		Men		Men	
Parental Resources								
Transfers (Rp10 ³)	-0.001	(-0.80)	-0.007	(-3.37)	0.001	(0.47)	0.003	(0.78)
Other Inc. (Rp10 ⁶)	2.403	(2.04)	-0.606	(-0.36)	-0.300	(-0.33)	0.087	(0.05)
Assets (Rp10 ⁶)	0.004	(0.10)	-0.023	(-0.45)	0.039	(1.02)	-0.039	(-0.68)
Parental Characteristics								
Age	-0.690	(-3.89)	-0.462	(-2.61)	-1.317	(-5.84)	-1.601	(-6.85)
Education ^a :								
Primary	0.736	(0.37)	1.612	(0.62)	-4.771	(-1.75)	-4.926	(-1.75)
Secondary	5.687	(1.37)	-15.148	(-2.21)	-8.083	(-1.64)	-11.162	(-1.88)
Married ^b	3.642	(2.11)	-0.440	(-0.19)	4.617	(1.03)	8.078	(1.62)
Disabled	-7.934	(-2.46)	-12.400	(-2.67)	-19.682	(-3.12)	-6.141	(-1.02)
Rural	-0.012	(-0.01)	5.285	(2.10)	5.066	(1.83)	-0.950	(-0.29)
Previous Work Status ^c								
Self-Employed	18.068	(9.29)	13.545	(5.63)	13.342	(3.48)	18.713	(3.75)
Government	3.624	(0.48)	16.414	(1.56)	-6.761	(-1.19)	-3.610	(-0.47)
Private	13.131	(4.57)	19.355	(5.24)	10.849	(2.59)	12.535	(2.27)
Coresiding Children's Characteristics								
Married	0.487	(0.26)			-1.086	(-0.43)		
Not Married	0.443	(0.31)			0.138	(0.09)		
Secondary Educ.	-2.346	(-1.70)			-0.503	(-0.29)		
Tertiary Educ.	-0.932	(-0.37)			-6.437	(-2.04)		
Constant	32.969	(2.74)	31.115	(2.51)	92.827	(5.28)	119.268	(6.71)
N	418		302		407		302	

^a Relative to no education.

^b Currently living with spouse.

^c Work status 20 years ago. The omitted category is not at work.

^d Number in each category.